Adult Immunization Update 2014

Dr. Andrew Kroger, MD, MPH
Medical Officer
Immunization Services Division

Michigan Regional Immunization Conferences
November 2014

National Center for Immunization & Respiratory Diseases
Immunization Services Division

Disclosures

- Dr. Kroger is a federal government employee with no financial interest or conflict with the manufacturer of any product named in the following presentations
- The off-label use of IIV, MMR, HPV and PCV13 vaccines will be discussed
- Vaccines not currently licensed by the FDA will not be discussed

2

Take Out Your Cell Phone

- You will have the opportunity to text answers to questions!
- Please note: message and data rates may apply

4

What's New in Adult Immunization

- Disease burden
- Schedules
- Adult vaccination coverage rates
- Pneumococcal vaccines
- Influenza vaccines
- Tdap and pregnancy
- Zoster vaccine
- Hepatitis B vaccine and HCP
- Immunization resources

Burden of Disease Among U.S. Adults for Vaccine-preventable Diseases

- **Influenza disease burden varies year to year**[1]
  - Millions of cases and average of 226,000 hospitalizations annually with more than 75% among adults
  - 3,000-49,000 deaths annually, more than 90% among adults
- **Invasive pneumococcal disease (IPD)**[2] **-** 13,000 invasive pneumococcal disease cases among adults 65 and older in 2013
- **Pertussis**[3] **-** 41,880 total reported cases 2012 (~9,000 among adults)
- **Hepatitis B**[4] **-** 3,350 acute cases reported 2010
- **Zoster**[5] **-** ~1 million cases annually

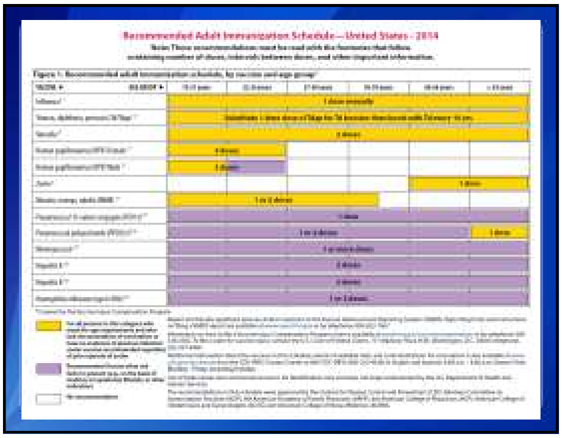
[1]CDC. Estimates of deaths associated with seasonal influenza United States, 1976-2007. *MMWR*. 2010; 59(33):1057-1062.
[2]CDC. Active Bacterial Core Surveillance. www.cdc.gov/abcs/reports_findings/survreports/spneu13.pdf
[3]CDC. Notifiable Diseases and Mortality Tables. *MMWR* 2013; 61(51&52):ND-719-ND-732.
[4]CDC. Viral Hepatitis Surveillance United States, 2010. National Center for HIV/AIDS, Viral Hepatitis, STD&TB Prevention/Division of Viral Hepatitis.
[5]CDC. Prevention of Herpes Zoster. *MMWR* 2008;57(RR 5):1-30.

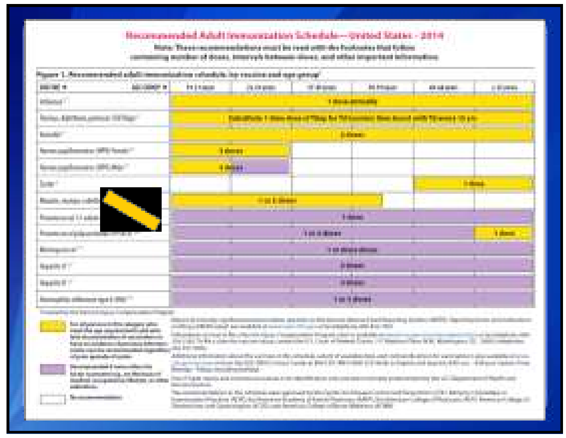
HPV and HPV Vaccine-preventable Cancers in Women and Men, 2005-2009

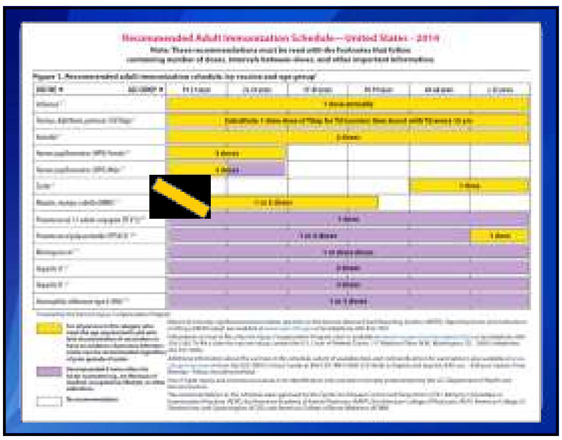
Anatomic Area	Average annual number of cases*	Attributable to HPV+	Attributable to HPV 16/18+
Cervix	11,279	10,150	7,470
Vagina	694	520	380
Vulva	3,039	2,100	1,480
Anus and rectum	3,084	2,810	2,450
Oropharynx	2,317	1,670	1,420
Total (Women)	**21,342**	**17,250**	**13,200**
Penis	1,003	630	480
Anus and Rectum	1,687	1,540	1,340
Oropharynx	9,312	6,700	5,730
Total (Men)	**13,446**	**8,880**	**7,550**

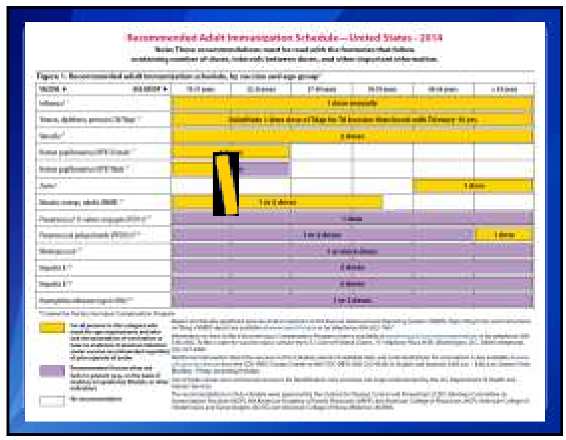
Jemal A et al. JNCI J Natl Cancer Inst 2013:lncl.djs491
Data presented by Saralya M, 28th International Papillomavirus Conference 2012, Puerto Rico

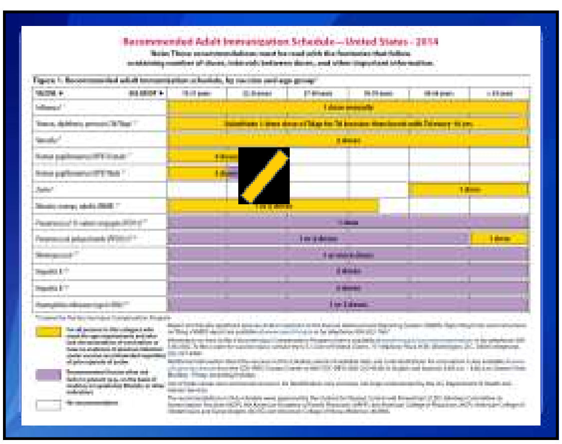
These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

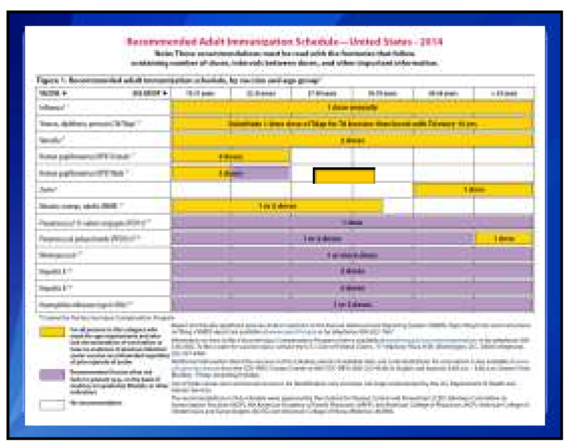




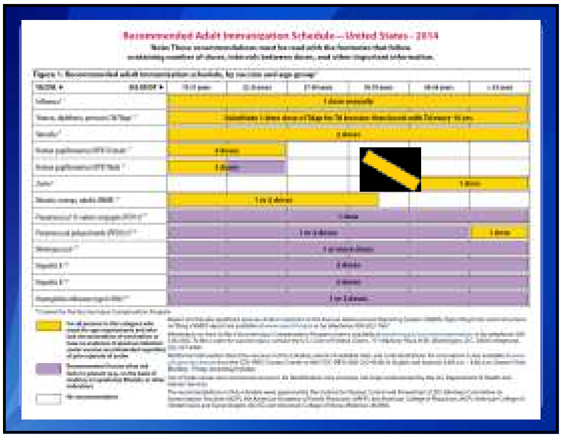


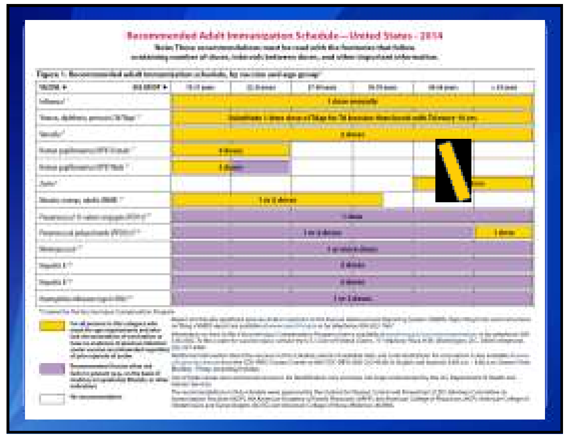


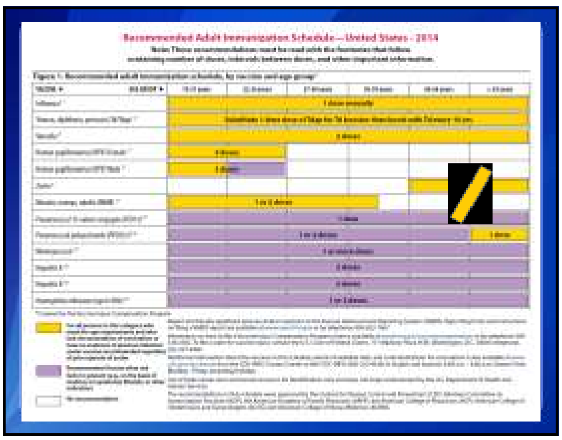


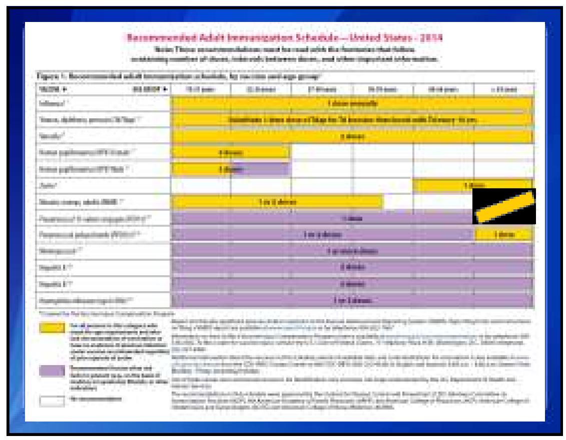


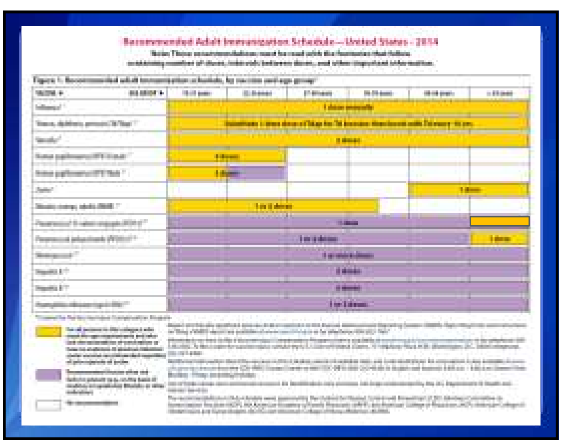
These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

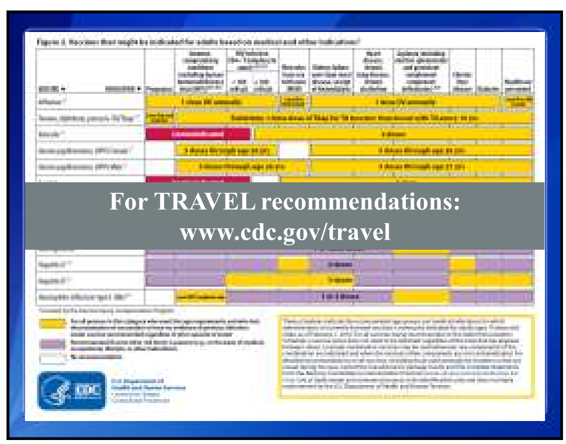








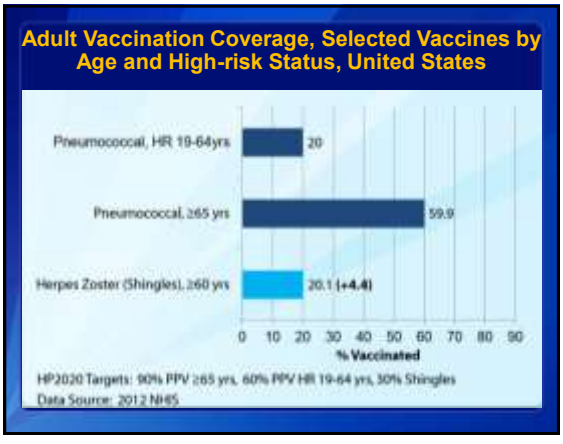


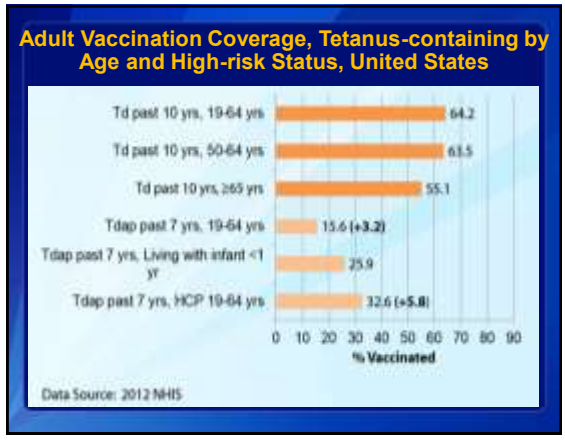


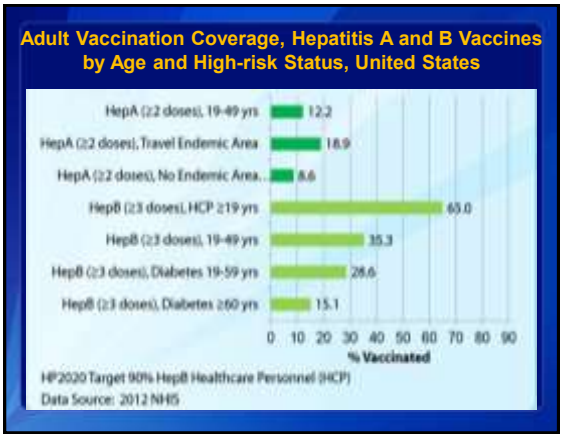
These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

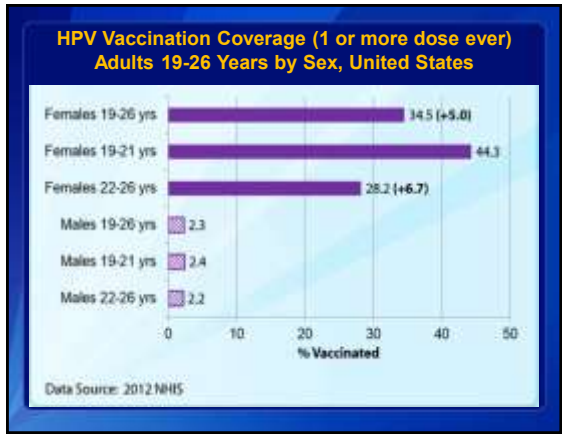
Influenza Vaccination Coverage among U.S. Adults: 2011-12, 2012-13, and 2013-14 Seasons

Group	2011-12 (%)	2012-13 (%)	2013-14 (%)*	Difference (%)
Persons ≥ 18 yrs	**38.8**	**41.5**	**42.4**	**3.6**
Persons 18-49 yrs, all	28.6	31.1	32.3	3.7
Persons 18-49 yrs, high risk	36.8	39.8	38.7	1.9
Persons 50-64 yrs	42.7	45.1	45.3	2.6
Persons ≥ 65 yrs	64.9	66.2	65.0	0.1









These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

UPDATED ACIP RECOMMENDATIONS FOR ADULTS

http://www.cdc.gov/vaccines/acip/index.html

PNEUMOCOCCAL VACCINES

www.cdc.gov/vaccines/pubs/ACIP-list.htm#pcv

Pneumococcal Vaccines

Characteristic	23-valent Pneumococcal Polysaccharide Vaccine (PPV23)	13-Valent Pneumococcal Conjugate Vaccines (PCV13)
Components	Purified polysaccharide	Purified polysaccharide covalently bound to carrier protein
Ages	2 years and older	6 weeks and older *
Number of serotypes	23	13
Effect against bacteremia	Substantial	Substantial
Effect against carriage	None	Substantial
Effect against non-bacteremic pneumonia	No consensus	Moderate
Route	Subcut or IM injection	IM Injection

*ACIP Off-label recommendation

Timeline for Adult Pneumococcal Vaccine Recommendations in the U.S.

PPSV23 recs updated to include smoking and asthma as indications for adults 19-64 years

Deferred routine recs for adults

Recommendations for PCV13 use in series with PPSV23 among adults ≥19 years olds with IC*

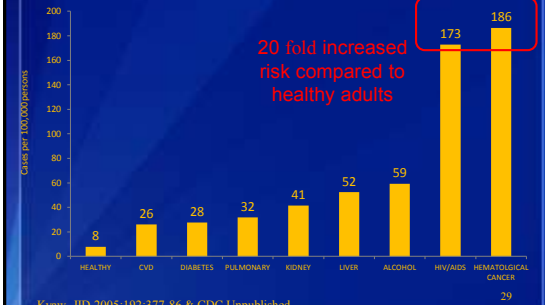
1983 **2010** **Dec 2011** **Feb 2012** **Jun 2012**

PPSV23 use for all adults ≥65 years and high risk adults 19-64 years

PCV13 licensed for adults ≥50 years

***IC** = with immunocompromising conditions, functional or anatomic asplenia, CSF leaks, or cochlear implants

Incidence of IPD in Adults Aged 18-64 Years with Selected Underlying Conditions, US, 2009



Kyaw, JID 2005;192:377-86 & CDC Unpublished

29

Prevention of Pneumococcal Disease Among Adults with Immunocompromising Conditions

Recommendation for PPSV23-naïve adults

Adults 19 years of age or older with immunocompromising conditions, functional or anatomic asplenia, CSF leaks, or cochlear implants, and who have not previously received PCV13 or PPSV23 should receive a dose of PCV13 first followed by currently recommended doses of PPSV23

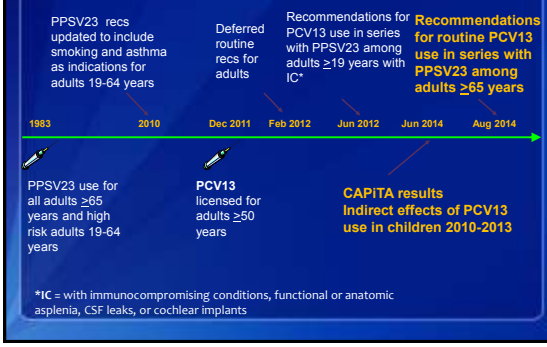
PCV13 + PPSV23 + PPSV23* + PPSV23 (@ ≥65 years)

≥8 weeks ≥5 years

*Second PPSV dose before age 65 years NOT recommended for adults with CSF leaks or those with cochlear implants

These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

Timeline for Adult Pneumococcal Vaccine Recommendations in the U.S.



*IC = with immunocompromising conditions, functional or anatomic asplenia, CSF leaks, or cochlear implants

Summary of Evidence Supporting PCV13 Use among Adults ≥65 Years of Age

- Results of a large trial demonstrated PCV13 prevents IPD and non-bacteremic pneumonia[1]
  - 75% reduction in vaccine type IPD
  - 45% reduction in vaccine type non-bacteremic pneumonia
- Safety demonstrated in clinical trials[1,2]
- Vaccine preventable disease burden remaining among adults ≥65 years
  - Estimated 2,600 PCV13 type IPD cases in 2013[3]
  - Over 50,000 PCV13-type inpatient CAP[4]

[1]CAPiTA, June 2014 ACIP
[2]Phase III trials, Pfizer, ACIP 2011, 2012
[3]Active Bacterial Core Surveillance, 2013
[4] CAP = Community acquired pneumonia

32

Summary of Evidence Supporting PCV13 Use in Series with PPSV23 Among Adults ≥65 Years of Age

- In the short-term, PCV13 likely provides adequate coverage of disease causing serotypes
  - 20-25% IPD due to PCV13 types[1]
  - ~10% of all CAP due to PCV13 types[2]
- Broader protection is expected to be provided through use of both PCV13 and PPSV23 in series
  - 38% of IPD due to serotypes unique to PPSV23[1]
- Immune response improved when PCV13 given before PPSV23 in series
- Optimal interval determined based on immune response, safety, the risk window for protection against PPSV-only types, practical considerations

[1]Active Bacterial Core Surveillance, 2013
[2] Estimate based on studies using serotype-specific urine antigen test, Pfizer.
CAP – Community acquired pneumonia

33

ACIP Recommendations for PPSV23 for Adults 19 Years and Older 2010

- Immunocompetent w/underlying condition

PPSV23 + PPSV23 (@ ≥65 years)
≥5 years

- Asplenic (sickle cell, hemoglobinopathy), Immunocompromised

PPSV23 + PPSV23 + PPSV23 (@ ≥65 years)
≥5 years ≥5 years

- 65 years or older with no high-risk condition

PPSV23

ACIP Recommendations for PCV13 and PPSV23 for Adults 19 Years and Older 2012

- Immunocompromised, Asplenic (sickle cell, hemoglobinopathy), CSF leaks, Cochlear Implants who are Pneumococcal-naive

PCV13 + PPSV23 + PPSV23* + PPSV23 (@ ≥65 years)
≥8 weeks ≥5 years ≥5 years

*Second PPSV23 dose before age 65 years NOT recommended for adults with CSF leaks or those with cochlear implants

*ACIP off-label recommendation for PCV13 for adults 19 through 49 years of age

ACIP Recommendations for PCV13 and PPSV23 for Adults 19 Years and Older 2012

- Immunocompromised, Asplenic (sickle cell, hemoglobinopathy), CSF leaks, Cochlear Implants who have previously received PPSV23

PPSV23 + PCV13 + PPSV23* + PPSV23 (@ ≥65 years)
≥1 year ≥8 weeks ≥5 years
≥5 years

*Second PPSV23 dose before age 65 years NOT recommended for adults with CSF leaks or those with cochlear implants

*ACIP off-label recommendation for PCV13 for adults 19 through 49 years of age

These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

ACIP Recommendations for PCV13 and PPSV23 for Adults 65 Years and Older 2014

- Pneumococcal-naïve or unknown vaccination history

PCV13 (@ ≥65 years) + PPSV23

6 – 12 months

- If PPSV23 cannot be given during 6-12 month window after PCV13, a dose of PPSV23 should be given during the next visit
- Minimum interval = 8 weeks

ACIP Recommendations for PCV13 and PPSV23 for Adults 65 Years and Older 2014

- Previously received one or more doses of PPSV23

PPSV23* (@ ≥ 65 years) + PCV13

≥ 1 year

PPSV23* (@ < 65 years) + PCV13 (@ ≥ 65 years) + PPSV23* (@ ≥ 65 years)

≥ 1 year ≥ 6 – 12 months

≥ 5 years

*Doses already administered

ACIP Recommendations for PCV13 and PPSV23 for Adults 65 Years and Older 2014

- Previously received one or more doses of PPSV23

PPSV23* (@ ≥ 65 years) + PCV13

≥ 1 year

PPSV23* (@ < 65 years) + PCV13 (@ ≥ 65 years) + PPSV23* (@ ≥ 65 years)

≥ 1 year ≥ 6 – 12 months

≥ 5 years

*Doses already administered

Categories of Adults 65 Years or Older

Received PCV13 previously?

Yes → No additional PCV13 doses needed

No or Unknown → Received one or more doses of PPSV23 previously?

Yes → Received at age ≥ 65 years?

Yes → PCV13 at least one year later

No → PCV13 (@ ≥ 65 years) and ≥ 1 year post PPSV23 followed by PPSV23 6-12 months later and ≥5 years after previous PPSV23

No or Unknown → Administer PCV13 (@ ≥ 65 years) followed by PPSV23 6-12 months later

Administering PCV13 and PPSV23 Vaccines General Rules

- PCV13 and PPSV23 should not be administered during the same clinic visit
  - Either vaccine may be administered with other vaccines
- Administer PCV13 before PPSV23 whenever possible

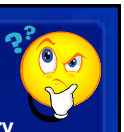
Michigan Provider Resources

"Quick Looks"

www.michigan.gov/documents/mdch/PPSV23_PCV13_Adults_101512_Final_401240_7.pdf

These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

What Do You Think?



A 66-year-old patient has had laboratory confirmed pneumococcal pneumonia. She has never been vaccinated with pneumococcal vaccine. She should receive:

A. PPSV23 only - Text IZ1A to 22333

B. PCV13 only - Text IZ1B to 22333

C. PCV13 now followed by PPSV23 - Text IZ1C to 22333

D. PPSV23 now followed by PCV13 – Text IZ1D to 22333

Note: Message and Data Rates May Apply **Poll Results**

PERTUSSIS VACCINATION OF PREGNANT WOMEN

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/tdap-td.html

ACIP Conclusions: Tdap and Pregnancy

- **Maternal antibodies from women immunized before pregnancy waned quickly (Healy 2012)**
  - Concentration of maternal antibodies unlikely high enough to provide passive protection to infants
- **A single dose of Tdap during one pregnancy is insufficient to provide protection for subsequent pregnancies**

Bottom Line

An infant's first dose of pertussis vaccine is the one you administer to his/her mom!

ACIP Recommendations: Tdap and Pregnancy

- **Administer Tdap to pregnant women during each pregnancy, regardless of previous Tdap vaccination history**
- **Ideally vaccinate between 27 through 36 weeks gestation although Tdap may be given at any time during pregnancy**
  - 27 through 36 weeks gestation is optimal timing to maximize the maternal antibody response AND passive antibody transfer to the infant

*ACIP off-label recommendation; *MMWR*. Vol. 62 No. 7; Feb. 22, 2013

Special Situations and Pregnant Women

- **Unknown or incomplete tetanus vaccination: should complete the 3-dose primary series**
  - Recommended schedule is 0, 4 weeks, and 6 through 12 months
  - Tdap should replace 1 dose of Td, preferably between 27- 36 weeks gestation
- **Wound care: previously unvaccinated pregnant woman should be given Tdap if Td is indicated for wound management**

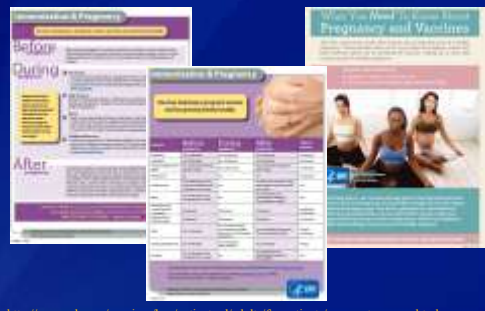
*ACIP off-label recommendation;
MMWR. Vol. 62 No. 7; February 22, 2013 and *MMWR* 2011:60 (No.41): 11424-1426

These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

Tdap and Postpartum Women

- **Postpartum women *not previously vaccinated* should be vaccinated immediately**
  - Including women who are breastfeeding
- **Do not administer Tdap to postpartum women who have already been vaccinated with Tdap**
  - Regardless of the length of time since Tdap vaccination

Resources for Providers and Pregnant Women



http://www.cdc.gov/vaccines/hcp/patient-ed/adults/for-patients/pregnant-women.html

What Do You Think?

Your patient just delivered her first child. She was previously vaccinated with Tdap as an adolescent. She did not receive Tdap during this pregnancy. Should you administer Tdap vaccine prior to discharge?

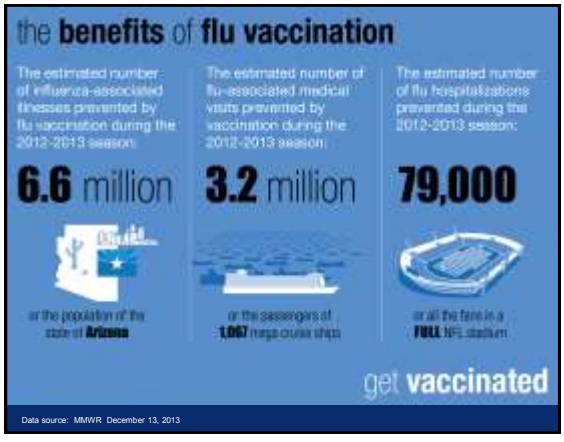
A. Yes – Text IZ2Y to 22333
B. No – Text IZ2N to 22333

Note: Message and Data Rates May Apply **Poll Results**

Seasonal Influenza

- **Updated ACIP recommendations were published August 2014**
- **Includes:**
  - Vaccine composition
  - Vaccination schedules for those
    - 6 months thru 8 years
    - 9 years and older
  - Guidance on product preference

www.cdc.gov/mmwr/pdf/wk/mm6332.pdf



These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

Influenza Vaccine Strains 2014-2015

- **No change from last year's vaccine strains**
- **Trivalent vaccine will contain:**
  - A/California/7/2009 (H1N1)pdm09-like virus
  - A/Texas/50/2012 (H3N2)-like virus
  - B/Massachusetts/2/2012-like virus
- **Quadrivalent vaccine contains the same three strains as in trivalent vaccine plus:**
  - B/Brisbane/60/2008-like virus

MMWR Aug 15, 2014; 63(32):691-7

25

Influenza Vaccines for 2014-15

- **Inactivated (IIV3)**
  - Age indications vary by product, formulation and presentation
  - Intramuscular or intradermal injection
  - Trivalent
- **Inactivated (IIV4)**
  - Age indications vary by product and presentation
  - Intramuscular injection
  - Quadrivalent
- **Live, attenuated vaccine (LAIV4)**
  - Intranasal
  - Quadrivalent

MMWR Aug 15, 2014; 63(32):691-7

Choice of Influenza Vaccine

- **Where more than one type of vaccine is appropriate and available, ACIP has no other preferential recommendation for use of any influenza vaccine product over another**
  - quadrivalent vs trivalent
  - high-dose vs standard dose

MMWR Aug 15, 2014; 63(32):691-7

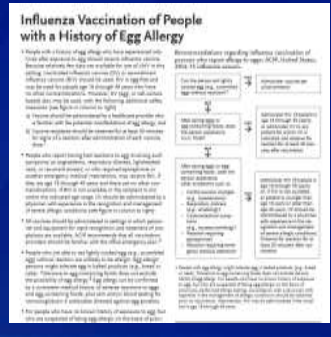
Influenza Vaccine Products/Presentations 2014-2015

Name	Age Range	# Antigens	Presentation	Route	Type/Abbrev.
Afluria	5 yrs and older	Trivalent	Pre-Filled Syringe Multi-Dose Vial	IM	Inactivated IIV3
	18 yrs thru 64 yrs	Trivalent	Pharmajet Injectors		
Fluarix	3 yrs and older	Trivalent	Pre-Filled Syringe	IM	Inactivated IIV3
		Quadrivalent	Pre-Filled Syringe	IM	Inactivated IIV4
FluBlok	18 yrs and older	Trivalent	Single-Dose Vial	IM	Recombinant RIV3
Flucelvax	18 yrs and older	Trivalent	Pre-Filled Syringe	IM	Cell Culture IIV3
FluLaval	[redacted]	Trivalent	Multi-Dose Vial	IM	Inactivated IIV3
		Quadrivalent	Pre-Filled Syringe Multi-Dose Vial	IM	Inactivated IIV4
FluMist	2 yrs thru 49 yrs	Quadrivalent	Pre-Filled Sprayer	Intranasal	Live Attenuated LAIV4
Fluvirin	4 yrs and older	Trivalent	Pre-Filled Syringe Multi-dose Vial	IM	Inactivated IIV3
Fluzone	6 months and older	Trivalent	Pre-Filled Syringe Multi-Dose Vial	IM	Inactivated IIV3
		Quadrivalent	Pre-Filled Syringe Single-Dose Vial Multi-Dose Vial	IM	Inactivated IIV4
Fluzone High-Dose	65 yrs and older	Trivalent	Pre-Filled Syringe	IM	Inactivated IIV3
Fluzone Intradermal	18 yrs thru 64 yrs	Trivalent	Pre-Filled Microinjection System	Intradermal (ID)	Inactivated IIV3

Influenza Vaccination Schedule

- **Annual single dose for all adults without contraindications or precautions**
- **IIV dosage for all adults is 0.5 mL**
- **LAIV dosage is 0.2 mL (0.1 mL in each nostril)**
  - 2 years – 49 years, healthy, not pregnant

Vaccinating People with Egg Allergy


Influenza Vaccination of People with a History of Egg Allergy

www.immunize.org/catg.d/p3094.pdf

These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

Influenza Vaccine and Pregnant Women

- For 2013–14 influenza season, influenza vaccination rate for pregnant women was 52.2%
- Women receiving a clinician recommendation and offer of influenza vaccination had higher vaccination coverage compared with women who reported receiving only a recommendation but no offer or reported receiving no recommendation, *even among those who reported having a negative attitude toward efficacy, safety of influenza vaccination, or no concern about influenza infection*

MMWR 63(37);816-821

Vaccinating Mom Also Protects the Baby

Influenza Vaccination Coverage 2013-14 Healthcare Personnel

Overall – 75.2%			
Setting		**Occupation**	
Hospital	89.6%	Physicians	92.2%
LTC	63.0%	Nurses	90.5%
		NPs & PAs	89.6%
		Pharmacists	85.7%
		Other clinical personnel	87.4%
		Assistants & aides	57.7%
		Nonclinical personnel	68.6%

MMWR; September 19, 2014 / 63(37);805-811

Influenza Vaccination Coverage 2013-14 Healthcare Personnel

Overall – 75.2%			
Setting		**Occupation**	
Hospital	89.6%	Physicians	92.2%
LTC	63.0%	Nurses	90.5%
		NPs & PAs	89.6%
		Pharmacists	85.7%
		Other clinical personnel	87.4%
		Assistants & aides	57.7%
		Nonclinical personnel	68.6%

MMWR; September 19, 2014 / 63(37);805-811

Influenza Vaccination and HCP

- Coverage was highest among HCP working in settings with flu vaccination requirements (97.8%)
- Coverage by workplace setting was lowest for those working in LTC settings (63.0%)
- Vaccination of HCP in LTC settings is extremely important because:
  - People 65 years and older are at greater risk of serious complications from the flu.
  - Flu vaccine effectiveness is generally lowest in the elderly, making vaccination of close contacts even more critical.
  - Multiple studies have demonstrated health benefits to patients, including reduced flu-related complications and reduced risk of death, with vaccination of HCP in LTC settings.

http://www.cdc.gov/flu/healthcareworkers.htm

CDC Patient Resources

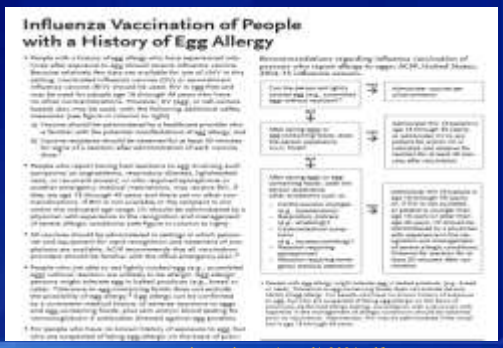
http://www.cdc.gov/flu/freeresources/print.htm

These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

Michigan for Provider and Patients Resources

www.michigan.gov/immunize

Vaccinating People with Egg Allergy



www.immunize.org/catg.d/p3094.pdf

ZOSTER VACCINATION

www.cdc.gov/mmwr/PDF/rr/rr5705.pdf

ACIP Recommendations for Zoster Vaccine

- Adults 60 years and older should receive a single dose of zoster vaccine
- Need for booster dose or doses not known at this time
- A history of herpes zoster should not influence the decision to vaccinate

MMWR 2008;57(RR-5)

Zoster Vaccine

- FDA licensed for adults 50-59 years of age
- Routine vaccination of adults younger than 60 years NOT recommended by ACIP
- Rationale
  - Burden of complications highest in persons older than 60 years
  - No recommendation for a booster dose

Zoster Vaccine

- It is not necessary to inquire about chickenpox or test for varicella immunity before administering zoster vaccine
- Persons 60 years of age and older can be assumed to be immune* regardless of their recollection of chickenpox

MMWR 2008;57(RR-5)

*For the purpose of establishing eligibility for zoster vaccine

These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

What Do You Think?

Your 66-year-old patient tells you she had herpes zoster (shingles) 4 years ago. Should you administer zoster vaccine?

A. Yes – Text IZ3Y to 22333

B. No – Text IZ3N to 22333

Note: Message and Data Rates May Apply Poll Results

HEPATITIS B AND HEALTHCARE PERSONNEL

www.cdc.gov/mmwr/pdf/rr/rr6210.pdf

Hepatitis B Vaccine and Healthcare Personnel (HCP)

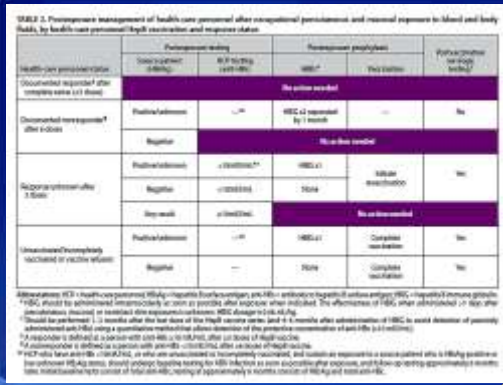
- **Management of HCP who have written documentation of a complete series of hepatitis B vaccine doses in the past who were not tested for antibody response following the vaccination series and who now test negative for anti-HBs**
  - administer 1 dose of hepatitis B vaccine then test for anti-HBs 1 to 2 months later
  - If anti-HBs <10mIU/L, give 2 more doses to complete a second series, then test again 1to 2 months later.
  - If negative, manage as hepatitis B vaccine non-responder

MMWR 2013;62(RR-10):1-19

Hepatitis B Vaccine and Healthcare Personnel (HCP)

- **Post-exposure prophylaxis**
  - when the HBsAg status of the source patient is unknown the exposed, unvaccinated, or incompletely vaccinated HCP should be managed as if the source patient were HBsAg positive
  - include a dose of HBIG in addition to starting or completing the vaccination series for all exposures where the HBsAg status of the source is unknown

MMWR 2013;62(RR-10):1-19



MMWR 2013;62(RR-10):1-19 35

ADDITIONAL ADULT IMMUNIZATION RESOURCES

These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.

Resources

- CDC Vaccines for Adults
  www.cdc.gov/vaccines/hcp/patient-ed/adults/
- CDC Influenza www.cdc.gov/flu
- National Foundation for Infectious Diseases (NFID) www.nfid.org
- ACOG www.immunizationforwomen.org

Special Thanks to

- Tamara Pilishvili, MPH
- Donna Weaver, RN MN
- Dr. Anne Schuchat, MD

These slides were presented at the MDCH Fall Regional Immunization Conference on Nov. 21, 2014, in East Lansing, Michigan. This information is valid as of 11/21/14.